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ABSTRACT

To determine how frequently various forms of anaphora appear in materials written for children, 1,000-word excerpts were analyzed from the second, fourth, and sixth grade texts of four basal reader series. The basal programs consisted of the "Ginn Reading Program," the "Houghton Mifflin Reading Program," "Scott, Foresman Reading," and "Harcourt Brace Jovanovich Bookmark Reading Program, Eagle Edition." A taxonomy of anaphoric relationships consisting of three main categories (noun substitutes, verb substitutes, and causal substitutes), each of which is broken down in various subcategories of anaphora, was used for identifying and classifying anaphora. The findings revealed that (1) the frequency of anaphora did not differ as a function of grade level of text; (2) the frequency of anaphora in narrative selections was significantly greater than in expository selections; (3) the frequency of anaphora differed as a function of publisher, and this could be traced primarily to significantly lower frequencies for the demonstrative, other pronouns, locative, and temporal categories for the Harcourt Brace Jovanovich series; and (4) grade level of basal reader, text genre, and publisher did not interact in any way. (HOD)

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Anaphora in Basal Reader Selections: How Frequently Do They Occur?

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Paper presented at the 35th Annual Meeting of the National Reading Conference San Diego, California, December 1985

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Anaphora in Basal Reader Selections: How Frequently Do They Occur?

James F. Baumann, Purdue University

Baumann and Stevenson (1986a) define anaphora as "linguistic devices which signal the coreferential identity, or near identity, of two concepts; language relationships in which a word or phrase is used in place of another word or phrase which has been introduced previously" (p. 10). Anaphora can be simple pronoun/antecedent relationships (e.g., Jenny ate the fish, and she said it tasted bad.), other noun substitutes (e.g., Dale and David walked into the room; the former had a beautiful girl on his arm.), or verb or clausal substitutes (e.g., Kate colored a picture, and Tim did too.). Taxonomies of anaphoric relationships have been suggested by Baumann and Stevenson (1986a), Pearson and Johnson (1978), Halliday and Hasan (1976), and others (e.g., Bormuth, Carr, Manning, & Pearson, 1970; Lesgold, 1974; Menzel, 1970; Webber, 1978).

Adults are reasonably skillful at comprehending anaphoric relationships (e.g., Caramazza, Grober, Garvey, & Yates, 1977; Clark & Sengul, 1979; Grober, Beardsley, & Caramazza, 1978; Hirst & Brill, 1980; Webber, 1978, 1980). However, there is considerable evidence that young and developing readers are not masterful at resolving a number of basic anaphoric relationships (e.g., Barnitz, 1980; Bormuth et al., 1970; Lesgold, 1974; Richek, 1976-77; Stevenson, 1980; see a review by Barnitz, 1986). Because of students' difficulty in resolving anaphora, several writers have proposed instructional strategies for teaching anaphora comprehension (Baumann & Stevenson, 1986b; Chapman, 1983; Gottsdanker-Willekens, 1986; McNeil, 1984; Pearson & Johnson, 1978), and several researchers have conducted experiments exploring the effectiveness of different strategies for teaching anaphora comprehension (Baumann, in press; Dommes, Gersten, and Carnine, in press.)

Given all the interest in evaluating children's ability to comprehend anaphora and in developing and testing instructional strategies (Irwin, 1986), it is surprising that no researcher has asked the question, "With what frequency do various forms of anaphora appear in materials written for children?" An answer to this question would guide researchers in conducting instructional experiments and direct curriculum developers in writing materials for teaching anaphora comprehension. Therefore, it was the purpose of this study to answer this basic question. Specifically, narrative and expository selections from basal readers were analyzed to determine how frequently various forms of anaphora appear in these texts.

Method

Materials

Excerpts 1,000 words in length were selected from the second-, fourth-, and sixth-grade texts of four popular basal reader series. The basal

programs that were analyzed were published by Ginn (Ginn Reading Program, Clymer, Indisano, Johnson, Pearson, & Venezky, 1985), Houghton Mifflin (Houghton Mifflin Reading Program, Durr, LePere, Bean, Glaser, & McCourt, 1983), Scott, Foresman (Scott, Foresman Reading, Aaron, Jackson, Riggs, Smith, & Tierney, 1983), and Harcourt Brace Jovanovich (HBJ Bookmark Reading Program, Eagle Edition, Early, Cooper, Santeusanio, 1983). Two 1,000-word narrative and two 1,000-word expository excerpts were identified from each second-, fourth-, and sixth-grade text for each publisher. This resulted in a total pool of 48,000 running words: 12,000 words from each of four publishers; 16,000 words at each of three grade levels; and 24,000 words each from narrative and expository selections.

Procedure

The researcher and a research assistant identified independently five narrative and five expository selections from each of the 12 basal readers. Two of the five narrative and two of the five expository selections from each book were selected randomly for analysis. For several second-grade basal readers, selections did not number 1,000 words. In those instances, an additional excerpt was selected randomly, and the balance of the 1,000 words was taken from the beginning of it.

A taxonomy of anaphoric relationships by Baumann and Stevenson (1986a) was used for identifying and classifying anaphora. This taxonomy consists of three main categories (noun substitutes, verb substitutes, clausal substitutes), each of which is broken down into various subcategories of anaphora. Based upon pilot analyses using the complete Baumann and Stevenson taxonomy, it becomes clear that anaphora from several categories (verb and clausal substitutes) appeared very infrequently in basal reader selections. It was also found that several categories were sufficiently similar (synonymous, superordinate, general term) that it would serve no purpose to identify examples of the separate categories. As a result several subcatetories were collapsed into more global categories, and this slightly modified version of the Baumann and Stevenson taxonomy was used for analyzing the basal selections. Table 1 presents the taxonomy used in this study.

The experimenter and research assistant each analyzed half (24) of the excerpts. Passage analyses were conducted in the following manner. First, each passage was read completely so that the content was familiar and so that coreferential items could be previewed. Second, the passage was read again, and all anaphoric terms (e.g., she, they, there, then, some) were underlined. Third, the passage was read one last time, and each underlined anaphoric term was categorized and tallied on protocol sheets that contained all the categories on Table 1. During this final reading, any anaphora missed during the second reading were categorized also. Table 2 presents a portion of one of the excerpts and exemplifies the procedures used to identify and classify anaphora.

From inspecting Table 2, several features of the anaphora analysis

procedure can be understood. First, it should be noted that identifying and classifying anaphora involved more than a simple identification of specific words. Whereas it was true that all instances of personal pronouns such as she and her were anaphoric, that was not true for many other apparent anaphora. For example, in the sentence, There's a bridge there, and I aim to use it if we can (see Table 2), the second there is anaphoric and is a locative form referring to Clinton; however, the first there (there's) is actually an expletive and hence is not anaphoric. Second, only endophora - coreferential items whose referents reside within the text - were identified and classified. Exophora, coreferential relationships in which the referent is outside the text, were not included in the analyses. For example, one night from the excerpt in Table 2 is exophoric. It refers to a specific time (i.e., month, year, date), but it is not specified in the text.

Third, it should be pointed out that instances in which the reference term either preceded or followed the antecedent were counted as anaphora. Technically, only instances in which the reference item follows the antecedent are truly anaphoric; situations in which the reference item precedes the antecedent are called cataphora. For example item 5 (where) and item 8 (here) in Table 2 appear before the referent in the text (Clinton); however, for this study, all endophora (i.e., anaphora and cataphora) were classified as anaphora.

To obtain a measure of interscorer agreement, three 1,000-word excerpts were selected randomly from the pool of 24 the experimenter and research assistant each analyzed. These additional excerpts were also analyzed, and this subset of six selections was used to determine scoring reliability. There was 97% agreement between the experimenter and research assistant on the identification of anaphoric terms. In addition, there was 98% agreement on the classification of anaphora once they were identified.

Results

Table 3 presents mean frequency scores per 1,000-word excerpt for the occurrence of all anaphora categories presented in Table 1 by grade, genre, and publisher. (The parenthetic code that follows each anaphora category on Table 3 is keyed to the category on Table 1.) Note that several superordinate categories are included in Table 3. For example, the category pronouns includes the subcategories personal, demonstrative, and other; the category nonpronouns includes the subcategories locative, temporal, synonymous, arithmetic, and deleted; and the category noun substitutes includes all pronoun and nonpronoun forms. Several additional summative values are included. The last column presents frequencies across all 48 selections, and the last row presents frequencies across all anaphora forms.

All values in Table 3 are mean frequencies per 1,000 running words

of text. For example, the 147.1 frequency in the first row and column of Table 3 means that there was an average of about 147 instances of total noun substitutes (i.e., all category I in Table 1) across the 16, 1,000-word excerpts taken from second-grade basal readers. Similarly, the 130.8 value in the last row and column means that there were an average of about 131 total occurrences of anaphora (all forms) across all 48, 1,000-word excerpts. To convert Table 3 values to percentages, simply divide each value by 10. For example, the 130.8 mean frequency would convert to 13.08% which means that, on the average, about 13% of all words in the excerpts were anaphora.

Inferential Statistics

In order to determine if the frequency of occurrence of anaphora differed by grade level of text, genre, and publisher, a 3 (grade: 2nd, 4th, 6th) X 2 (genre: narrative, expository) X 4 (publisher: Ginn; Scott, Foresman; Houghton Mifflin; Harcourt Brace Jovanovich) multiple analysis of variance (MANOVA) was conducted for the following ten partial scores: personal pronouns, demonstrative pronouns, other pronouns, locative, temporal, synonymous, arithmetic, deleted, verb substitutes, and clausal substitutes. These ten scores were selected because they accounted for all the anaphora forms (with no redundancy) and included the basic forms of all noun substitute and verb/clausal substitute categories (see Table 1).

The MANOVA indicated a significant main effect for genre, F (10, 15) = 3.335, $p < .018$, indicating that overall there were significantly greater numbers of anaphora occuring in narrative selections (M across all forms = 152.5) than in expository selections (M across all forms = 109.0). Univariate tests for the ten component scores in the MANOVA indicated statistically significant differences for locative forms, F (1, 24) = 5.150, $p < .033$, and personal pronoun forms, F (1,24) = 22.565, $p < .001$.

The MANOVA also revealed a significant main effect for publisher, F (30, 45) = 3.059, $p < .001$. Univariate tests for publisher were significant for the following component scores: demonstrative, F (3, 24) = 8.347, $p < .001$; other pronouns, F (3, 24) = 7.273, $p < .001$; locative, F (3, 24) = 4.356, $p < .014$; temporal, F (3, 24) = 5.815, $p < .004$; and deleted, F (3, 24) = 3.765, $p < .024$. Post hoc tests for the demonstrative, other pronouns, locative, and temporal scores indicated that Harcourt Brace Jovanovich differed significantly (lower) from the other three publishers ($p < .05$ or less for each contrast). For the deleted category, Ginn and Scott, Foresman differed (higher) from Houghton Mifflin and Harcourt Brace Jovanovich ($p < .05$).

The MANOVA for the grade main effect did not attain statistical significance. Likewise, the MANOVAs for the two-way interactions and the three-way interaction were not statistically significant.

Descriptive Statistics

Table 4 presents frequency information for the categories of anaphora presented in Table 1. The first column indicates the percentages of words that were within different categories of anaphora across the entire 48,000-word sample. For example, 12.9% of all 48,000 words examined were noun substitutes. The second column indicates the relative frequency with which different forms of anaphora occurred. For example, 98.3% of all anaphora that were identified were noun substitutes.

From inspecting the data in Table 4, several generalizations about anaphora in basal readers can be made. First, anaphora are relatively frequent phenomena. Overall, about 13% of all words were anaphora (i.e., the sum of noun substitutes and verb/clausal substitutes). This frequency is even greater for narrative-only passages, in which anaphora accounted for over 15% of all words.

Second, it is clear that noun substitutes predominate. About 98% of all instances of anaphora were noun substitutes whereas only about 2% were verb or clausal substitutes.

Third, pronouns are the most frequently occurring form of noun substitute. About 86% of all anaphora were pronouns (or about 11% of all words in the 48,000-word sample), and personal pronouns alone accounted for about 73% of all anaphora. When frequencies for individual personal pronouns were calculated, the five most frequently occurring pronouns (he, it, I, you, she, in descending order of frequency) accounted for 41.5% of all anaphora. Or, stated another way, these five pronouns alone accounted for over 5% of all words in the 48,000-word sample.

Discussion

The results of the anaphora analysis can be summarized as follows. Inferential statistics reveal that (a) the frequency of anaphora did not differ as a function of grade level of text; (b) the frequency of anaphora in narrative selections was significantly greater than in expository selections; (c) the frequency of anaphora differed as a function of publisher, and this could be traced primarily to significantly lower frequencies for the demonstrative, other pronouns, locative, and temporal categories for the Harcourt Brace Jovanovich series; and (d) grade level of basal reader, text genre, and publisher did not interact in any way. Descriptive statistics indicate that noun substitutes comprise the vast majority of all anaphora. Pronouns, and especially personal pronouns, constitute the most frequently occurring form of noun substitute. Personal pronouns alone account for 73% of all anaphora, and when narrative-only texts are examined, personal pronouns account for 87% of all forms of anaphora.

The instructional implications of these findings are several. Given

students' difficulty resolving anaphoric relationships (Barnitz, 1986) greater attention should be given to anaphora comprehension instruction in light of their relatively high frequency of occurrence in basal readers. Furthermore, because of the highly skewed distribution of anaphora toward noun substitute categories, it only makes sense that most instruction focus on teaching students to resolve anaphora involving nouns, especially pronouns.

Gottsdanker-Willekens (1986) found considerable variation in suggestions for teaching anaphora comprehension in basal reader materials. She also learned that most reading methods textbooks either glossed over or ignored completely the area of comprehension of anaphora. Therefore, teachers may be relatively unfamiliar with the notion of word substitutes and are presented with little guidance for teaching anaphora within commercial materials. As a result, better pre- and in-service training of teachers must occur if students are to learn to comprehend anaphoric relations.

There are several implications for educational publishers. Publishers ought to be aware that anaphora - especially noun substitutes - occur quite frequenly in basal reader selections. Given students' difficulty in resolving anaphoric relations, it would behoove publishers to do two things. First, publishers should devote greater attention to selecting instructional passages that contain considerate anaphora. By considerate anaphora is meant that (a) referents are clearly and explicity stated in the text, (b) referents appear in advance of the anaphoric term, and (c) there is little ambiguity as to the appropriate referent for an anaphoric term. It is not recommended, however, that materials be written according to these guidlines, for that could result in an abuse similar to the problems associated with writing selections in accordance with readability formulae. Rather, it is recommended that publishers inspect and select for use only those naturally-written passages that are reasonably anaphora considerate.

Second, educational publishers need to provide teachers more guidance in how to directly teach anaphora comprehension. Students can be taught to comprehend anaphora (Baumann, in press; Dommes et al., in press), but more and better instructional procedures incorporated into commercial materials are needed (Durkin, 1981; Gottsdanker-Willekens, 1986). Instructional strategies and guidelines recommended by Baumann and Stevenson (1986b), McNeil (1984), Pearson and Johnson (1978), Chapman (1983), and Gottsdanker-Willekens (1986) provide good models for the development of better commercial materials.

Finally, there are several implications of these findings for future research. First, given the high frequency of occurrence of anaphora in basal reader materials, more basic research is required to specify further the developmental sequence with which youngsters acquire mastery of various anaphora and to identify those particularly troublesome

anaphora forms. As Barnitz (1986) notes, there are a number of studies on children's anaphora comprehension, and these studies are analogous to a "large jigsaw puzzle with the thousands of pieces scattered across various academic fields, with many pieces and the picture on the box missing" (p. 45). In other words, more specificity regarding what children can do and cannot do regarding anaphora comprehension is required.

Second, more instructional research is needed. Baumann (in press) and Dommes et al. (in press) have conducted the only instructional studies to date. Much more needs to be learned about effective strategies for teaching students to comprehend anphora.

Third, research exploring the effects of anaphora considerate versus anaphora inconsiderate texts is yet to be conducted. It is unknown if providing students more cohesive natural texts provides them a distinct advantage in comprehending anaphora and in overall comprehension of the text. Also, more research on the effect of text genre (narrative vs. expository) is required, for extant research is equivocal (cf., Baumann, in press; Kameenui & Carnine, 1982) on this issue.

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Table 1

Modified Version of the Baumann and Stevenson (1986a) Taxonomy Used to Identify and Classify Anaphora in Basal Reader Selections

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I. NOUN SUBSTITUTES

A. Pronouns

1. Personal (subjective, objective, possessive; singular and plural)

2. Demostrative (this, that, these, those)

3. Other (relative, interrogative, indefinite, reciprocal, reflexive, intensive)

B. Nonpronouns

1. Locative (here, there, where)

2. Temporal (e.g., then, now, before, after, later)

3. Synonymous (e.g., boy/lad, taxi/cab)

4. Arithmetic (e.g., one, some, all, none, few, several)

5. Deleted (e.g., I like all candy, but gum drops are the best [ ]).

II. VERB/CLAUSAL SUBSTITUTES

A. Verb (e.g., Tom sings well but Jim does not.)

B. Clausal (e.g., Nancy will paint a picture. Otto will too.)

Table 2

Example of How Anaphora were Identified and Classified

Emma Jane was guiding the herd up the western edge of Missouri. One night as she[1] studied a rough map in the firelight, her[2] brother[3], Martin, came and crouched beside her[4].

"Where[5] are we[6], Emmy?"

Emma Jane pointed with a blunt-nailed finger. "We're[7] heading right up here[8], so we[9] can cross the Grand River near Clinton. There's a bridge there[10], and I[11] aim to use it[12] if we[13] can[14]."

Every day brought them[15] closer to Clinton. If there were to be a problem, this[16] is where[17] it[18] would come.

Anaphoric term	Antecedent	Category
1. she	Emma Jane	personal pronoun
2. her	Emma Jane	personal pronoun
3. brother	Martin	synonymous
4. her	Emma Jane	personal pronoun
5. where	near Clinton	locative
6. we	Emma Jane, Martin	personal pronoun
7. we're	Emma Jane, Martin	personal pronoun
8. here	near Clinton	locative
9. we	Emma Jane, Martin	personal pronoun
10. there	Clinton	locative
11. I	Emma Jane	personal pronoun
12. it	bridge	personal pronoun
13. we	Emma Jane, Martin	personal pronoun
14. can	use the bridge	clausal
15. them	Emma Jane, Martin, herd	personal pronoun
16. this	bridge at Clinton	demonstrative
17. where	bridge at Clinton	locative
18. it	problem	personal pronoun

From "Trail Boss," Flights of Color (sixth-grade text) of the Ginn Reading Program (Clymer et al., 1985).

Table 3

Mean Frequency of Occurrence of Anaphora in Forty-Eight 1,000-Word Basal Reader Excerpts

Anaphora category		Grade two	Grade four	Grade six	Narrative	Expository	Ginn	SF	HM	HBJ	All excerpts
Noun substitutes (I)	M	147.1	111.7	127.0	150.0	107.2	124.8	130.3	132.6	126.8	128.6
	SD	45.9	33.6	31.9	25.7	40.0	41.1	36.0	31.4	52.1	39.7
Pronouns (I.A)	M	131.8	95.7	110.7	132.7	92.7	103.4	114.0	120.0	113.4	112.7
	SD	42.5	35.2	32.0	26.4	39.8	39.4	36.0	31.0	50.5	39.0
Personal (I.A.1)	M	113.3	80.1	92.6	114.3	76.3	87.0	92.1	95.8	106.3	95.3
	SD	44.5	31.0	30.3	24.6	39.5	38.6	35.5	25.3	49.8	37.6
Demonstrative (I.A.2)	M	9.3	6.8	8.8	8.3	8.3	7.9	10.1	11.9	3.3	8.3
	SD	4.9	5.6	5.9	5.6	5.4	4.4	4.0	6.2	2.5	5.4
Other (I.A.3)	M	9.2	8.8	9.3	10.1	8.1	8.5	11.8	12.3	3.8	9.1
	SD	7.0	5.1	7.5	7.0	5.9	6.2	6.6	5.5	4.0	6.5
Nonpronouns (I.B)	M	15.4	16.0	16.3	17.3	14.5	21.3	12.3	12.6	13.4	15.9
	SD	6.6	6.7	11.4	8.5	8.2	10.0	4.1	7.7	8.4	8.3
Locative (I.B.1)	M	3.5	3.6	2.8	8.2	2.4	4.2	3.3	4.8	1.0	3.3
	SD	3.7	2.5	3.0	3.3	2.6	3.7	2.0	3.5	1.3	3.7
Temporal (I.B.2)	M	6.1	4.1	3.2	4.7	4.3	5.9	6.3	4.2	1.5	4.5
	SD	4.3	3.0	3.0	4.0	3.3	3.0	3.0	3.3	3.5	3.6

Table 3 continued

Anaphora category		Grade two	Grade four	Grade six	Narrative	Expository	Ginn	SF	HM	HBJ	All excerpts
Synonymous (I.B.3)	M	1.1	1.8	5.1	3.2	2.1	4.8	2.1	0.5	3.3	2.7
	SD	1.6	2.4	9.5	6.5	5.3	9.0	2.5	1.0	7.0	5.9
Arithmetic (I.B.4)	M	3.4	4.8	3.8	3.7	4.3	4.0	3.1	2.3	6.6	4.0
	SD	2.9	5.2	3.6	3.1	4.7	4.2	2.7	2.2	5.0	3.9
Deleted (I.B.5)	M	1.3	1.8	1.4	1.5	1.4	2.5	1.5	0.9	1.0	1.5
	SD	1.4	1.5	1.6	1.4	1.6	2.6	1.6	1.2	1.2	1.5
Verb/clausal (II)	M	1.9	2.1	2.4	2.5	1.8	2.3	2.0	0.8	3.4	2.1
	SD	2.7	2.6	2.0	2.8	2.0	2.1	3.0	1.3	2.6	2.4
Verb (II.A)	M	0.4	0.4	0.6	0.5	0.4	0.7	0.5	0.0	0.7	0.5
	SD	1.0	0.9	0.9	0.9	0.9	0.9	1.2	0.0	1.1	0.9
Clausal (II.B)	M	1.5	1.7	1.9	2.0	1.4	1.7	1.5	0.8	2.8	1.7
	SD	2.4	2.2	1.5	2.2	1.8	1.7	2.6	1.3	2.1	2.0
All forms (I + II)	M	149.0	113.8	129.4	152.5	109.0	127.1	132.3	133.4	130.3	130.8
	SD	46.8	33.6	32.2	25.8	40.3	41.1	36.9	31.4	52.7	40.0

Notes. Parenthetic statements after each anaphora category are keyed to categories in Table 1.

There were 16, 1,000-word excerpts per grade level; 24, 1,000-word excerpts for each genre; and 12, 1,000-word excerpts for each publisher. This resulted in a total of 48, 1,000-word excerpts.

Table 4

Percentage of All Words and Percentage of All Anaphora for Various Anaphora Categories Across All Texts

Anaphora Category	Percentage of all words	Percentage of all anaphora
Noun substitutes (I)	12.9%	98.3%
Pronouns (I.A)	11.3%	86.2%
Personal (I.A.1)	9.5%	72.9%
Demonstrative (I.A.2)	0.8%	6.3%
Other (I.A.3)	0.9%	7.0%
Nonpronouns (I.B)	1.6%	12.2%
Locative (I.B.1)	0.3%	2.5%
Temporal (I.B.2)	0.5%	3.5%
Synonymous (I.B.3)	0.3%	2.1%
Arithmetic (I.B.4)	0.4%	3.1%
Deleted (I.B.5)	0.2%	1.1%
Verb/clausal (II)	0.2%	1.6%
Verb (II.A)	0.05%	0.4%
Clausal (II.B)	0.2%	1.3%

Note. Parenthetic statements after each anaphora category are keyed to categories in Table 1.